

THE DACETINE ANT GENUS
PENTASTRUMA (HYMENOPTERA: FORMICIDAE)¹

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The genus *Pentastruma* was established by Forel (*loc. cit. infra*) on the basis of a single Taiwanese worker specimen that he described (*P. sauteri*) as having 5 antennal segments, a very unusual number even for a member of the Dacetini, to which tribe he indicated that it belonged. In several ways, the description read as though based on a depilated species of *Smithistruma*, and when, several years ago, Dr. Masao Kubota sent specimens of a nearly hairless short-mandibulate dacetine from Japan, WLB suspected that it might be close to *Pentastruma sauteri*, despite the fact that its antennae displayed the 6-merous condition usual in strumigenite dacetines.

Now we have finally discovered the location of the Hans Sauter Collection of Taiwanese ants, in the Institut für Pflanzenschutzforschung (BZA) der Akademie der Landwirtschaftswissenschaften der Deutsche Demokratik Republic in Eberswalde. Through the kind offices of Dr. G. Morge we have been able to borrow some critical formicid types from the Sauter material, among them the unique specimen of *Pentastruma sauteri*. This worker proves to be close to the Japanese species received from Dr. Kubota, but it is specifically distinct. It does also have 6 antennomeres, with the normal strumigenite proportions, and not 5 as stated by Forel. In its general form, *P. sauteri* is a rather typical *Smithistruma*, except for its complete lack of standing or other conspicuous hairs on head, trunk and petiole, and the new Japanese species matches it in these respects.

It seems logical that *Pentastruma* should eventually be merged with *Smithistruma*, but the latter genus is itself not stable at this

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time, because new species have been discovered (mostly unpublished) that seem likely to link it with such senior genera as *Trichoscapa* and *Codiomymex*.

Until more of these new species have been formally described and properly analyzed, no firm classification of the short-mandibulate strumigenites is practicable. It seems best to retain some of the available generic names for now, if only to avoid excessive combinatorial changes as the classification develops.

Accordingly, we retain the name *Pentastruma* for the time being. We figure for the first time the type species, *P. sauteri*, and supplement its original description, and we describe a second species, *P. canina*, from Japan, based on all 3 castes.

Measurements and proportions, and their abbreviations, are those standard in papers on Dacetini, e.g., Brown, 1953, Amer. Midl. Nat. 50: 7 ff., and 1973, Pacific Insects 15: 259.

Pentastruma

>*Pentastruma* Forel, 1912, Ent. Mitt. 1: 50. Type species: *Pentastruma sauteri* Forel, monobasic.

Worker: Like *Smithistruma* in size, and form of head, mandibles and remainder of body, including the 6-merous antennae; small funicular segments II and II separate and distinct. Clypeus with median tumulus and broadly extended anterolateral apron; anterior margin concave in outline. Mandibles depressed, porrect, with rounded basal lamella and no diastema, up to 15 acute teeth and denticles of varying length, including small apical tooth. Labrum with 2 long, tapered lobes, as in *Smithistruma*.

Body densely reticulate-punctulate and opaque (feebly shining in some views), but postpetiolar disc and gaster smooth and shining, except for basigastric costulae. Head, trunk, petiole and appendages without erect hairs, and even the pubescence reduced to a virtually invisible (at 50X) dilute vestiture of minute, appressed to decumbent hairs. The under-mouthparts have some small standing hairs. Postpetiole and gaster with a few short, blunt-tipped or remiform, standing hairs, mostly arranged symmetrically. Color testaceous to light ferruginous.

Queen: Like the *Smithistruma* queen, but with differences corresponding to those of the worker. Thoracic dorsum with a few

short, slender but stiff, erect hairs. Pronotum with a flat, C-shaped, marginate dorsal platform; scutum rising abruptly above this.

Male: As in *Smithistruma*.

Distribution as known: Japan (Honshu and southward); Taiwan. Almost certainly occurs on the Asian mainland, but not yet collected there.

Pentastruma sauteri

Fig. 1

Pentastruma sauteri Forel, 1912:51, worker. Type loc.: Pilam, Taiwan. Holotype worker: TL 2.2, HL 0.62, HW 0.43, ML 0.06, WL 0.55 mm; CI 69, MI 10.

The figure shows well the full-face outline view of head and mandibles. The head is shorter, with vertex more convex, than in *P. canina*, and the mandibles are shorter and more "set into" the anterior clypeal concavity. Although we have been unable to view the mandibular dentition directly and in detail in the lone holotype specimen, it seems that a rounded basal lamella is present, and that a series of sharp teeth follows without a diastema. The number of teeth (12?) may be slightly smaller than in *P. canina*, and the sizes of the teeth seem to be more evenly graded.

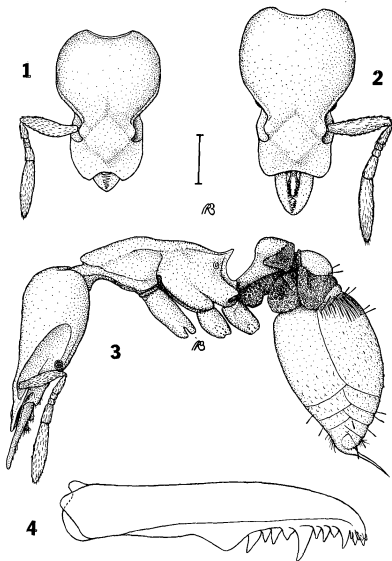
Viewed from the side, *P. sauteri* is much as shown in the side view of *P. canina* (Fig. 4), except that in *sauteri*, the upper vertex is more prominent, so that the head is thicker at this point dorsoventrally, and the transition from frontal to occipital faces of vertex more abrupt. The truncal dorsum is more strongly sinuate in side view; the propodeal teeth are also shorter and less acute than in *canina*, and the propodeal lamella wider. The erect pilosity of the gastric dorsum and apex is even more reduced, in hair number and size, than in *canina*. In the *sauteri* type, the middle of the mesopleura is weakly shining, though still sculptured, and the dorsolateral margins of the trunk are completely lacking.

P. sauteri still remains known only from this single specimen from Taiwan.

Pentastruma canina new species

Figs. 2, 3, 4

Holotype worker: TL 2.9, HL 0.77, HW 0.55, ML 0.16, WL 0.72, petiole L 0.30, eye L 0.05, scape L 0.32, hind femur L 0.46, hind tibia L 0.35 mm; CI 71, MI 21.



Figures 1-4. *Pentastruma* spp., workers. Fig. 1, *P. sauteri* holotype, head in full-face dorsal view. Fig. 2, *P. canina* new species, paratype from type nest series, head in full-face dorsal view. Fig. 3, same, side view. Fig. 4, same, another paranidotype, mandible greatly enlarged. Figs. 1-3 to same scale; scale line = 0.2 mm. Drawings by Ronald G. Boisvert.

Habitus as shown for the paratype in Figs. 2 and 4. Note the depressed, flat mandibles and the 6-merous antennae, with segments proportioned as in *Smithistruma*, and also the broadly extended, sharp-edged, lamelliform, free lateral margins of the clypeus, translucent in bright light. Mandibular armament shown in detail in Fig. 3. After the broadly rounded basal lamella there follow without a diastema 15 teeth, of which the first, fifth, and ninth are the longest. Between these, 2 groups of 3 smaller teeth each, in each such triplet, the middle tooth a little longer than the 2 flanking it. A similar triplet follows the ninth tooth, and after this 2 small subapical teeth and a robust apical tooth. Labral lobes at rest extending beyond the midlength of the mandibles. Mandibular surface very finely sculptured, weakly sericeous-shining.

Pronotum with rounded, strongly marginate anterior margin (excluding cervix), faintly indicated but rounded humeri, feebly marginate or submarginate dorsolateral margins, widest (W about 0.31 mm) behind midlength, tapering caudad into subparallel-sided posterior half of trunk (W about 0.16 mm across propodeal dorsum), which even widens again very slightly caudad. Metanotal groove obsolete or nearly so as viewed from above; propodeal teeth approximately parallel. Faint margins extend the length of the dorsolateral borders of the trunk, but these are visible only in certain views and lights.

Petiolar node subquadrate (rounded in front), slightly wider (W about 0.15 mm) than long, its dorsal surface with sculpture partly effaced, weakly shining. Postpetiolar disc transversely elliptical, nearly twice as wide as long (L 0.15, W 0.27 mm), smooth and shining, with a widely spaced pair of inclined hairs near posterior border. Gaster with weak basidorsal costulae, effaced mesad, the longest extending about a quarter of the length of the first tergum. Erect, feebly enlarged hairs: 4 near base of first gastric tergite, a pair near midlength, and a pair near posterior border of first tergite; remaining segments with 2 or 4 hairs each on tergites, and a few fine ventral, erect hairs also on apical half of gaster. The fine, short, extremely dilute, appressed and decumbent pubescence is invisible except at high magnifications (over 50X) and in special, strong lights, and is best developed on mandibles, antennae, vertex, legs, and gaster, though nowhere evident without a special effort to find it.

Color medium testaceous; spongiform appendages sordid whitish-testaceous.

Type deposited in the Museum of Comparative Zoology, Harvard University.

Queen (Based on 7 specimens from 4 localities, including type nest series): TL 3.0–3.3, HL 0.77–0.80, HW 0.57–0.59, ML 0.17–0.18, WL 0.80–0.84, forewing L (3 specimens) 2.4–2.6 mm; CI 73–75, MI 22–23. Largest specimen (from Kiyosumiyama, HL 0.80 mm) with scape L 0.33, eye L 0.13 mm.

With the usual differences from the worker. Pronotum with flat dorsal pronotal platform, as seen from above, markedly constricted before it joins the mesothorax. Scutellum rounded and bulging caudad. Petiolar node broader than in worker, and tending to be medially sulcate in front. Scutum irregularly reticulate-punctate, its surface weakly shining in some lights, opaque in others. Color testaceous to medium ferruginous, usually slightly darker than worker.

Male (3 specimens from Manazuru and Shirahama): TL 2.7–2.8, HL 0.56–0.60, HW including eyes 0.45–0.47, eye L 0.20–0.22, WL 0.82–0.83, forewing L 2.3–2.4 mm.

Color blackish-brown, gaster dark reddish-brown, legs and antennae sordid, pale, dull brown; wings hyaline. Mandibles slender, each with a weak tooth-like angle apicad of midlength, only slightly curved, probably not opposable, tapered to a very acute apex. Labrum broad, the 2 lobes short and separately rounded.

Antennal scape broader and longer than pedicel, and about as broad as the apical antennal segment; segments III through XII slender and cylindrical, all longer than scape or pedicel. Pronotum forming a flattened, C-shaped platform, something like that of female. Mesonotum large and bulging; notauli present but short, and not meeting behind to form a V or Y; parapsidal lines present. Scutellum bulging, rounded caudad. Propodeal teeth low, subacute, with narrow, concave infradental lamellae. Mesokatepisternum and a patch on the side of the propodeum with sculpture effaced, nearly or quite smooth and shining.

Petiole claviform, with low, rounded, scarcely differentiated node that is mainly smooth and shining above; spongiform appendages reduced to a narrow mid-ventral strip and a fine, cariniform posterodorsal collar. Postpetiole broader than long, rounded, smooth and shining, with a narrow, posterior collar of transparent lamella and an anteroventral spur trimmed narrowly with transparent lamella. Gaster unadorned at base, smooth and shining, with an extremely sparse, inconspicuous sprinkling of tiny, appressed

pubescence hairs, and a very few obliquely erect, short, fine hairs on tergum of basal segment, plus some more of these nearer the gastric apex. Legs with dilute, fine, inconspicuous, decumbent and appressed pubescence. Head, trunk, antennae, legs and sides of petiole predominantly finely reticulate-punctulate, opaque, with the exceptions noted above.

Paratypes: 38 workers, 8 queens (alate and dealate) and 2 males, all from JAPAN. HONSHU: Manazuru, Kanagawa Pref. (type locality), 3 nest series; 4 April 1968 (with males), 20 Oct. 1968, 5 Jan. 1973 (with winged queens), all leg. M. Kubota. Hamaoka, Shizuoka Pref., 15 Nov. 1976, leg. R. Egawa. Kiyosumiyama, Chiba Pref., 17 Aug. 1976, leg. T. Kannari. Shirahama, Wakayama Pref., 6 Jan. 1971 (with males), leg. M. Kubota. KYUSHU: Miyazaki-jingu, Miyazaki Pref., 18 July 1971, leg. M. Shindo. Deposited in the collection of Dr. Masao Kubota, at Odawara, Kanagawa Pref., Japan; in the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A.; and in the Department of Entomology, British Museum (Natural History), London.

The variation of worker paratypes is most marked in body size, relative head width, acuteness and width of propodeal teeth and trailing lamellae, and in depth of ferruginous coloration, often varying to faded straw color (in callows?). TL 2.5–2.9, HL 0.68–0.78, HW 0.48–0.56, ML 0.14–0.16, Eye L 0.04–0.06, WL 0.62–0.72 mm; CI 66–74 (mean 71 for $n = 16$), MI 19–22.

P. canina, widespread in central and southern Japan, is readily distinguishable from *P. sauteri* by the form of the head and mandibles (Figs. 1 and 2). From the known *Smithistruma* and *Trichoscapa* species of eastern Asia, the *canina* worker may be separated by its head shape and by the total lack of standing pilosity on head, scapes and trunk.

Dr. Masao Kubota, of Odawara, Kanagawa Prefecture, Japan, deserves thanks, not only for the opportunity to study the many excellently prepared specimens of *P. canina*, but also for notes on the biology of the species summarized below.

P. canina is an uncommon species, found in the Kantō District and southward. It inhabits the floor of coastal evergreen broadleaved forest, which is generally subtropical. Nests are found in small pieces of rotten wood, rotten fallen branches, under moist leaf litter, or at a slight depth in the humus. The largest colony censused contained one queen and 57 workers.